

Name: KEY

CS 589 Principles of Database Systems  
Winter 2011  
Quiz 5

No books or notes.

Consider tuples with 0 or more unknown nulls.

Define tuples  $t_1$  and  $t_2$  to be *compatible* (written  $t_1 \# t_2$ ) if there is a tuple  $u$  such that  $t_1 \sqsubseteq u$  and  $t_2 \sqsubseteq u$ .

5-A. (8 points) For each pair of tuples below, say whether  $t_1 \# t_2$ . If so, give a tuple  $u$  that is more informative than both.

a.  $t_1 = \langle 11 \text{ unk unk } 44 \rangle$     $t_2 = \langle 11 \text{ } 22 \text{ unk unk} \rangle$

*compatible,  $u = \langle 11 \text{ } 22 \text{ unk } 44 \rangle$  (There are other  $u$  values that work; they are all more informative than this one.)*

b.  $t_1 = \langle 11 \text{ unk unk } 44 \rangle$     $t_2 = \langle 11 \text{ unk unk unk} \rangle$

*compatible,  $u = \langle 11 \text{ unk unk } 44 \rangle$*

c.  $t_1 = \langle 11 \text{ unk unk } 44 \rangle$     $t_2 = \langle 11 \text{ unk unk } 45 \rangle$

*not compatible, because of the fourth component (Note that the problem specifies we are using unk nulls, so we can't use an inc null in this position.)*

d.  $t_1 = \langle 11 \text{ unk unk } 44 \rangle$     $t_2 = \langle 11 \text{ } 22 \text{ } 33 \text{ } 44 \rangle$

*compatible,  $u = t_2$*

5-B (2 points) Is compatibility transitive? That is, do  $t_1 \# t_2$  and  $t_2 \# t_3$  imply  $t_1 \# t_3$ ? Explain.

*Not transitive. For example, both  $t_1$  and  $t_2$  in c. above are compatible with  $\langle 11 \text{ } 22 \text{ unk unk} \rangle$ , but not with each other.*